



International Markets For Gaseous Fuelled Vehicles

Overview For NGVTF

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Westport
INNOVATIONS INC.



International Markets

- International markets are important for widespread growth of NGV's:
 - ▶ Many international markets have conditions favorable to NGV's.
 - ▶ Can lead to faster volume increase in both products and enabling technologies (eg infrastructure).
 - ▶ Access to larger volume markets will improve the economics of NGV's for North America.
- Global Energy Demand
 - ▶ Industrial growth of international economies, particularly China and India, causing stress on existing petroleum reserves and supply channels.



Market Drivers for NGV's

- Markets are conducive to NGV's when some or all of the following apply:

- ▶ Fuel price advantage for natural gas over diesel
- ▶ Infrastructure exists or growth plans actively accommodate natural gas for transportation
- ▶ Growing economy base with increasing transportation needs

environmental impact

employment and product purchasing

reduction in product purchasing

reduction in petroleum consumption

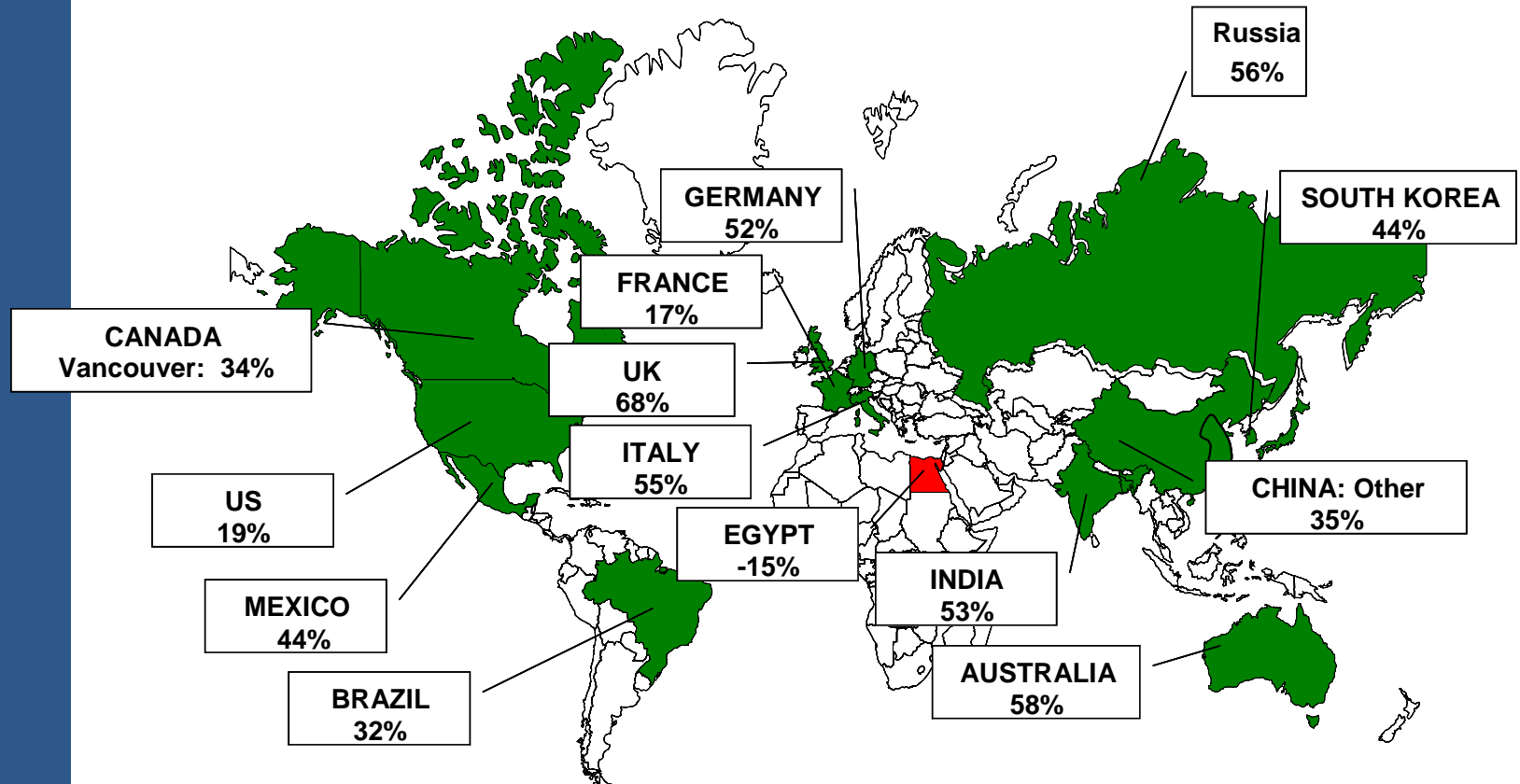
Petroleum reduction

vehicle manufacturers

vehicle manufacturers



Natural Gas Price Differential



- Many markets where CNG is priced favorably
- Key is availability as transportation fuel, either LNG or CNG



Cummins Westport Inc. (CWI)

- Westport's 50/50 JV with Cummins
- Focused on Spark Ignited Mid-Range engines
- Products are available today tailored for most international markets
- Four engine models available today (195-320 HP)
- Over 12,000 CWI-equipped vehicles on the road
- 30 different vehicle OEM's in production with CWI engines
- Looking to localize manufacturing of BGI in India and China in 2006



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CWI in Beijing

- Largest advanced CNG bus fleet in the world with over 2,200 CWI engines in service
- Operate 18 hrs per day, 7 days per week
- 400 trained service personnel - strong service support is a critical component
- 90% of Beijing fleet (18,000 buses) to be clean fuel by 2008 Olympics





Westport Activity in Global Markets

- Westport is actively engaged in the development of technologies and partnerships to further the deployment of Direct Injection gaseous fuelled products worldwide.
- Includes :
 - ▶ Canada
 - ▶ Japan
 - ▶ Europe
 - ▶ Australia
 - ▶ China



Canada

- No federal or provincial fuel taxes on natural gas
- Focus on GHG reductions
 - 5 Volvo VN660/VN430 Class 8 Trucks
 - 450 HP / 1650 ft-lb
 - Dual LNG tanks for 700-900 km range
 - Entered service May 2005.
 - 115,000km on fleet to date.





Japan

- Isuzu ELF is the most popular truck in the world
- Improvements with Westport engine technology:
 - ▶ 25-35% efficiency improvement over current natural gas product sold in Japan
 - ▶ Lower greenhouse gas emissions and other pollutants
 - ▶ Higher performance
- Delivery of “second generation” truck prototypes near completion

ISUZU





Europe

- Continuing partnership with MAN to evaluate HPDI for HD truck and bus.
- Ongoing technology development with Ford and BMW for Hydrogen ICE's.





Australia

- MOU with Energy Developments Limited (EDL) of Queensland, Australia to consider off-road applications in Australia.
- Driver is fuel cost savings and GHG reductions:
 - ▶ a typical mine truck uses over \$0.5 million in fuel per year
 - ▶ Fuel cost savings of \$100,000/year per truck or more is possible
 - ▶ emission reductions of approximately 14 tonnes of nitrogen oxides, 650 kilograms of particulate matter, and 950 tonnes of greenhouse gases per year
- Mine applications may provide parallel opportunity for HD LNG truck deployments.





China

More than 18 proposed LNG Terminal projects, located where transportation demand is concentrated.

Transportation is being considered at planning stage.

Westport has signed MOU with Yuchai, a major engine manufacturer to evaluate business opportunities for direct injection natural gas engines.



Source: Cambridge Energy Research Associates.

Note: In some market regions, terminal proposals may be in direct competition with each other, and therefore mutually exclusive.

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Conclusions

- Westport considers international markets to have significant, positive, impacts for gaseous fuelled engines.
 - ▶ Continuing pressure on global energy supply promoting adoption of alternative fuels
 - ▶ Development of a high volume base for gaseous fuelled products
 - ▶ Growth in investment and demand for fueling infrastructure
- Westport is actively engaged in several of the major markets, building partnerships and looking to promote the deployment of today's, and tomorrow's, gaseous engines.